



CLUB

The official magazine of the LEGO TECHNIC Club

September 1996

Crusades in Space
featuring LEGO
TECHNIC Advanced Sets

Apollo 13 - The Story
plus your chance to win
great prizes

**What's Cooking in Product
Development?**
Meet the team behind LEGO
TECHNIC inventions

TRING snaps
another LEGO
TECHNIC
builder

PLUS!

PLUS!

PLUS!

The GREAT
LEGO TECHNIC
Challenge
See your
winning
model
featured
as a
building plan

LEGO

LEGO Technic

CRUSADES



For hundreds of years, man has watched the skies, fascinated by the stars and planets. Yet it wasn't until 1961 that Russian cosmonaut Yuri Gagarin escaped the pull of the Earth's gravity to become the first man in space.

Since then, more than 300 people have flown in space in a variety of spacecraft. Today, most astronauts travel in the Space Shuttle, which launches like a rocket, flies like a spacecraft and lands like a glider.

The first American Space Shuttle Columbia was launched on 12th April 1981. Since then, many more Shuttles have been launched. A huge space 'bus', the Shuttle is a cross between a space

GETTING OFF THE GROUND

The hardest part about going into space is getting off the ground - because gravity pulls everything back to the Earth.

Gravity - or G force - is the force which pulls objects downwards onto the ground.

LIFT OFF!

A Space Shuttle going into space has to break away from the Earth's gravity. To do this, the Shuttle blasts into space using two huge rocket boosters powered by thousands of litres of fuel. The rockets ignite and giant clamps holding the spacecraft are released. Ground Control calls 'LIFT OFF!' and the Shuttle is launched into space. As it climbs, the rocket boosters separate and parachute back to Earth, as new engines ignite.

WORKING IN ORBIT

Once the Shuttle is in orbit, the payload doors open and work begins. From here, astronauts use computers to launch satellites into space and check the Orbiter's systems. Scientists in the crew carry out experiments.

LIFE ON BOARD

Because there is no gravity, life is very different in space. Meals come in special containers which are heated up in a small galley kitchen. To sleep, astronauts are strapped into sleeping bags - any way up, because their bodies are weightless. They use showers which look like bags, which stop water drops from floating around.

MOVING ABOUT

On board the Orbiter, astronauts float about weightlessly. If they want to stand still they strap their boots to fixed stations inside the craft. Inside there is room for seven crew, led by a commander.

LAUNCHING SATELLITES

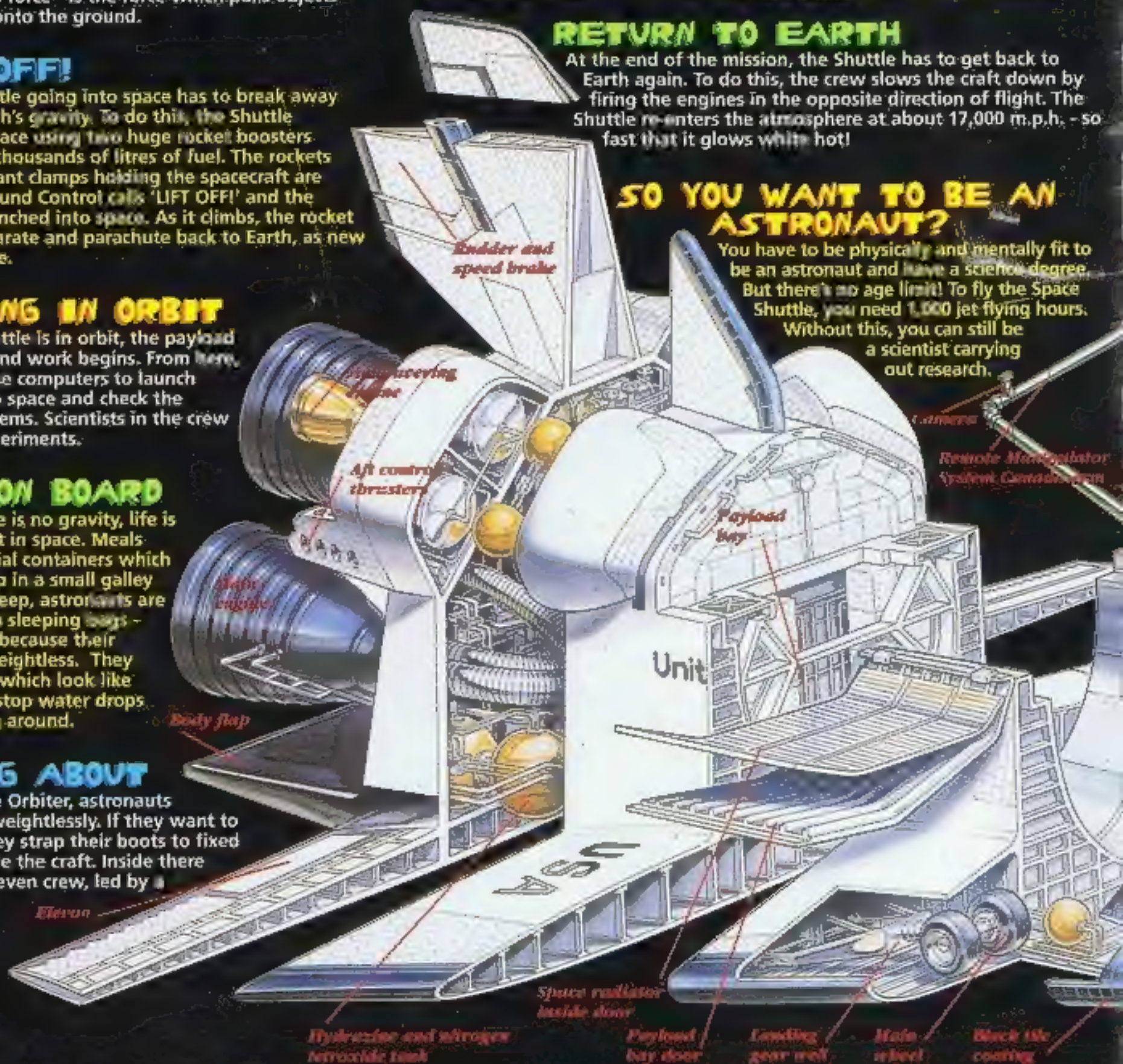
The Shuttle uses a special robot arm to launch satellites and probes into space from the payload bay. This is called the Remote Manipulator System (RMS). The LEGO TECHNIC Space Shuttle has a robot arm called the Canadian Arm. The arm has a giant claw which opens and closes to grip hold of satellites.

RETURN TO EARTH

At the end of the mission, the Shuttle has to get back to Earth again. To do this, the crew slows the craft down by firing the engines in the opposite direction of flight. The Shuttle re-enters the atmosphere at about 17,000 m.p.h. - so fast that it glows white hot!

SO YOU WANT TO BE AN ASTRONAUT?

You have to be physically and mentally fit to be an astronaut and have a science degree. But there's no age limit! To fly the Space Shuttle, you need 1,000 jet flying hours. Without this, you can still be a scientist carrying out research.



IN SPACE



LEGO TECHNIC
MAGAZINE...

JUST
BIG

ation and a plane. It is an Orbiter which
used to carry people and experiments
to space and bring back equipment and
satellites to Earth.

LEGO TECHNIC has launched its own
Space Shuttle Colorado (8480) in the
Advanced Sets. With special Fibre Optic
System (FOS) and new technical features,
the Space Shuttle brings the latest in space
technology to LEGO TECHNIC builders!

Our main feature in this issue
compares the Colorado to real life Space
Shuttles that have flown many missions.

Build your own LEGO TECHNIC Space
Shuttle and imagine you're an astronaut
piloting a mission to discover the
mysteries of space.....to face the dark
beyond and **glow** with Colorado as she
boldly goes....

TECHNICAL DATA

**ORBITER
LENGTH:**
37.24 M
(122 FT 2IN)

**ORBITER
HEIGHT:**
12.27 M
(56 FT 8IN)

WINGSPAN:
23.79 M
(78 FT 1IN)

PAYLOAD BAY:
18.3 M x 4.6 M
(56 FT 8IN)

SHUTTLE ORBIT SPEED:
28,160 KM/H
(17,500 MPH)

**MISSION
DURATION:**
BETWEEN
5 AND 30
DAYS

ALTITUDE IN ORBIT:
BETWEEN 185 AND
1,110 KM
(115 AND 690 MILES)

**ORBITER
WITHSTANDS
TEMPERATURES
UP TO 1,260°C
(2,300°F)**

Astronaut stands on
platform fitted to RMS
to repair satellite

Satellite

Low temperature
thermal insulation

Mission
operations
displays and
controls

Rear view
window

1st floor

Commander

Reinforced carbon
(RCC) sheath

Airlock

Rendezvous and
docking controls

Sleep station

Nostril wheel

Nose cone

LEGO

This mag
motor c
the Can
The

1

2

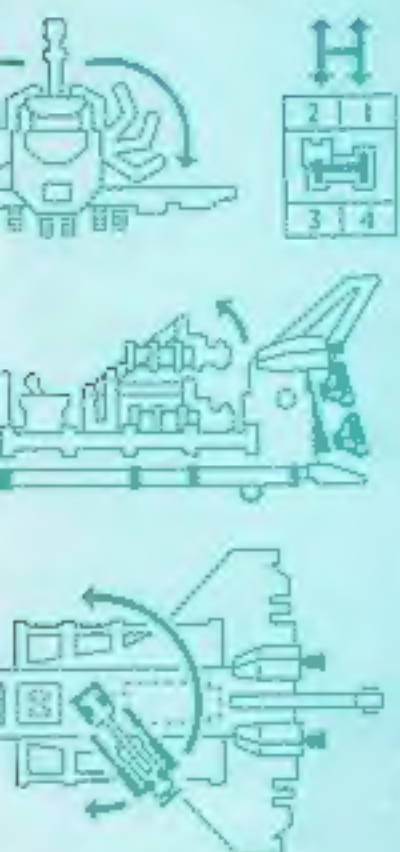
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Illustration taken from
'Look Inside Cross
Sections - SPACE'
courtesy of publishers
Dorling Kindersley
Limited, London
Tel: 0171-636 3411

LEGO TECHNIC SPACE SHUTTLE TECHNICAL DATA

This magnificent model has two motors. The LEGO TECHNIC controls four functions: Open the hatches (1), lifting the Solar Arm (2), turning it (3) and the FOS Light (4). A micro motor unfolds the satellite's wings (A).



4



A

SIGNIFICANT DATES IN SPACE FLIGHT & EXPLORATION OF SPACE

- 1957 USSR launches SPUTNIK 1 (the world's first artificial satellite) and later that year the dog Laika is launched into space.
- 1961 Yuri Gagarin of the USSR is the first man to be launched into space.
- 1963 Valentina Tereshkova is the first woman in space.
- 1969 Americans Neil Armstrong and Edwin (Buzz) Aldrin are the first men to land and walk on the moon.
- 1971 USSR launches first space station, Salyut 1.
- 1973 USA's SKYLAB space station is launched and crewed by astronauts.
- 1975 US Apollo and Soviet Soyuz dock together in space.
- 1976 Viking 1 and 2 land on Mars.
- 1979 Voyager 2 flies past Jupiter and sends back wonderful images of this giant planet.
- 1981 First flight by US Space Shuttle with the Columbia Orbiter.
- 1986 A number of space probes explore Halley's Comet.
- 1989 First direct broadcast TV satellite is launched.
- 1990 Hubble Space telescope is launched.
- 1991 Helen Sharman is the first Briton in space.
- 1994 Servicing mission of the Hubble space telescope.
- 1996 NASA unveils its new space rocket for the 21st century (which will replace the space shuttle).
- 1996 Britain joins the European ARIANE 5 space programme.

LEGO TECHNIC Magazine takes a look behind the scenes at the making of the space film "Apollo 13".

When Apollo 13 lifted off on 11th April, 1970, the world hardly noticed. It was only eight months since the crew of Apollo 11 had landed on the moon - and people were getting bored of space travel.

Suddenly, across the giant void of space, the words "Houston, we have a problem" were heard.

On the way to the moon, an explosion aboard the service module had left astronauts Jim Lovell, Fred Haise and Jack Swigert stranded - over 200,000 miles from Earth.

They were 78 hours from home with only ten hours of power - and their oxygen was running out.

All over the world, people held their breath and hoped that NASA scientists would find a way to get the three men back to Earth.

This real-life story of survival was brought to life in the film "Apollo 13". It was released last year and you can get it on video or wide screen from 7th October.

The film stars Tom Hanks as Mission Commander Jim Lovell and the other astronauts are played by actors Kevin Bacon and Bill Paxton. All three men had to do some serious preparation for filming.

They went to NASA's Space Camp in Huntsville, Alabama to train inside a

simulated command module and lunar model. They learned how to operate a spacecraft using over 500 switches, toggles and buttons.

In Houston, Texas, they experienced zero gravity on board a NASA plane that loops to give the same feeling of weightlessness.

"Houston, we have a problem."



And they met real-life astronauts Jim Lovell and David Scott, Commander of Apollo 13.

The spacecraft model used for the film was built in Kansas by KCSC Space Works Inc. which repairs real-life spacecraft. Two lunar modules and two command modules were built using some of the original Apollo materials.

Space Works also made special pressure suits for the actors to wear. The suits are exact copies of the real thing and are even air-tight. When the actors put the suits on, oxygen had to be pumped in to coat them down and help them to breathe.

If you are a LEGO TECHNIC fan, you'll love "Apollo 13". If you haven't yet watched the film, why not see it in colour? There are some fantastic space scenes and you can pretend you're in command of your own LEGO TECHNIC Space Shuttle heading towards the moon.

APOLLO 13 SPACE COMPETITION

You could win a great prize in our Apollo 13 Space Competition!

1st Prize

The winner gets a LEGO TECHNIC Space Shuttle Columbia (8480) plus a Video copy of "Apollo 13".

2nd Prize

two runners up will each get a LEGO TECHNIC Multi Racer set (8456) plus a video copy of "Apollo 13".

3rd Prize

there are ten 3rd prizes of "Apollo 13" videos.

Just write your answers to the following questions on a postcard and send it marked "Apollo 13 Space

Competition" to The LEGO TECHNIC Club at the address below. (Don't forget to add your name, address and membership number).

- 1 Who played Mission Commander Jim Lovell in the film "Apollo 13"?**
- 2 How many astronauts were on board Apollo 13?**
- 3 How far from home were the astronauts when the explosion happened?**

**Post your entry to:
Apollo 13 Space Competition
The LEGO TECHNIC CLUB
LEGO UK Ltd
Wrexham LL13 7TQ**

Closing date: 31st October, 1996.

RESCUE!

**"LEGO
TECHNIC
SPACEMAN
TO THE**



APOLLO 13

it's a fact

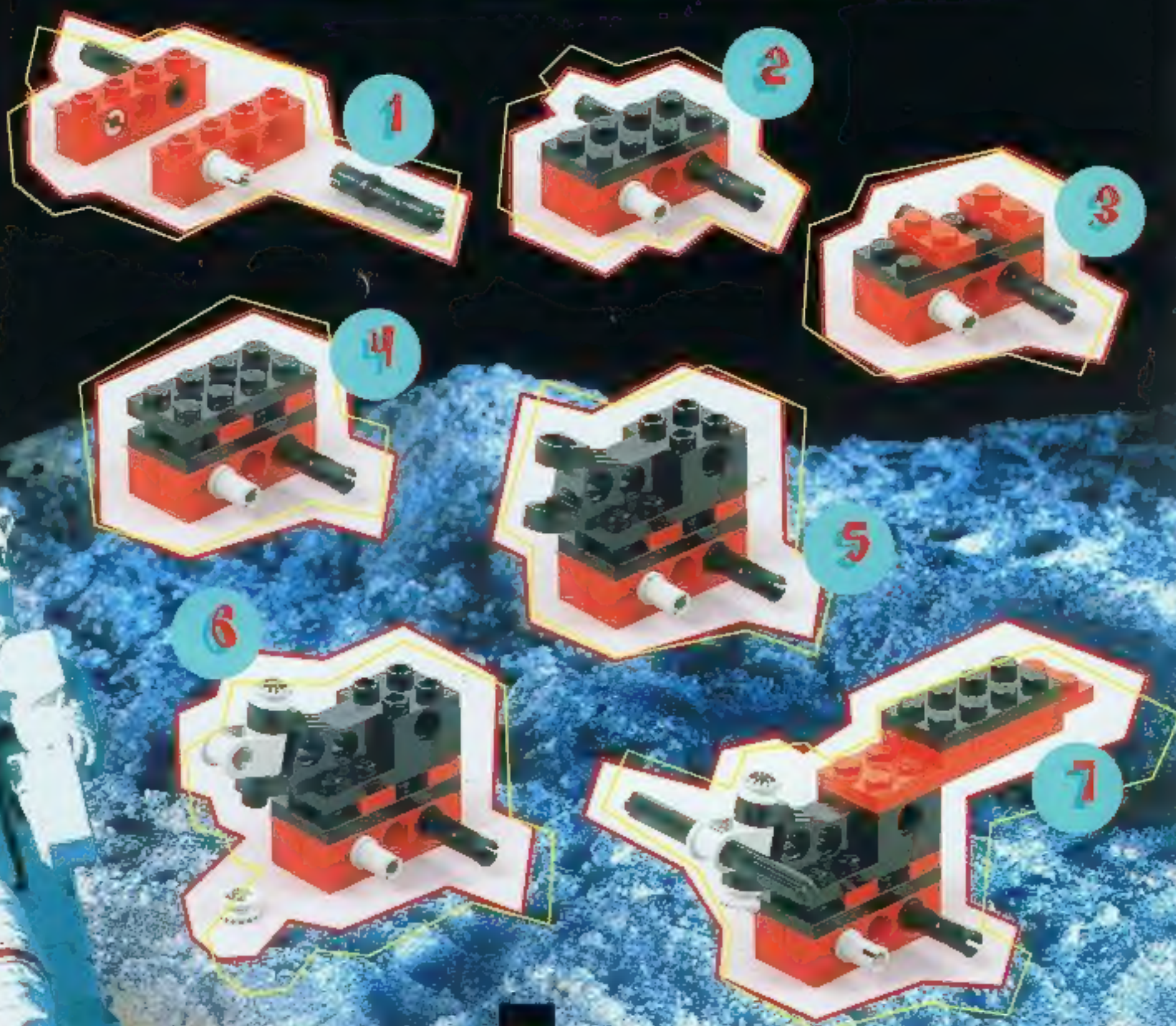
THE LEGO TECHNIC RANGE WAS FIRST INTRODUCED IN 1977

Cosmic TRIKE

FOLLOW THESE SIMPLE STEPS AS A BASIC GUIDE

BUT DON'T WORRY IF YOUR MODEL LOOKS DIFFERENT.

WITH A LITTLE IMAGINATION, WHO KNOWS WHAT YOU CAN COME UP WITH.



it's a fact

THE LEGO TECHNIC DAYTONA SUPER CAR HAS MORE THAN 1,300 ELEMENTS



it's a fact

THERE ARE 271 SEPARATE LEGO TECHNIC ELEMENTS

TOP SECRET

WHAT'S COOKING...

LEGO TECHNIC Magazine visited LEGO Headquarters in Billund, Denmark for a behind-the-scenes look at how LEGO TECHNIC models are made.

INTRODUCING Søren Holm and the team in Product Development.



Søren is 31 years old and lives in Denmark, near Billund, home of the LEGO and LEGO TECHNIC workshops. He has worked in Product Development since leaving college eight years ago and specialises in designing LEGO TECHNIC models.

A lot of what happens in Product Development is top secret, but Søren has agreed to let LEGO TECHNIC Magazine in on a few of the secrets!

Q Have you always been a LEGO TECHNIC fan?

A Man and boy! I used to build models of ships, trains and planes when I was a schoolboy, so working at LEGO TECHNIC is a dream come true!

Q What happens in Product Development?

A Every LEGO TECHNIC model begins life in Product Development. First we get an idea for a model, then we carry out all kinds of research all over the world. Sometimes we invite children into our studios to see if they like our ideas.

Q What happens next?

A When we're certain the idea is a good one, we start to develop the model and all its working parts. It might have a control centre or a motor that we need to build lots of prototypes and do lots of tests to make sure everything works.

Q How long does it take to design and build a LEGO TECHNIC model?

A We work a couple years ahead of the market, and that's how long it takes for an idea for a model to find its way into the LEGO and LEGO TECHNIC catalogue!

At the moment we're designing the 1998 and 1999 ranges!

Q What model designs are you most proud of?

A In total, there are 33 designers in the team, each one of them a specialist in either electronics,



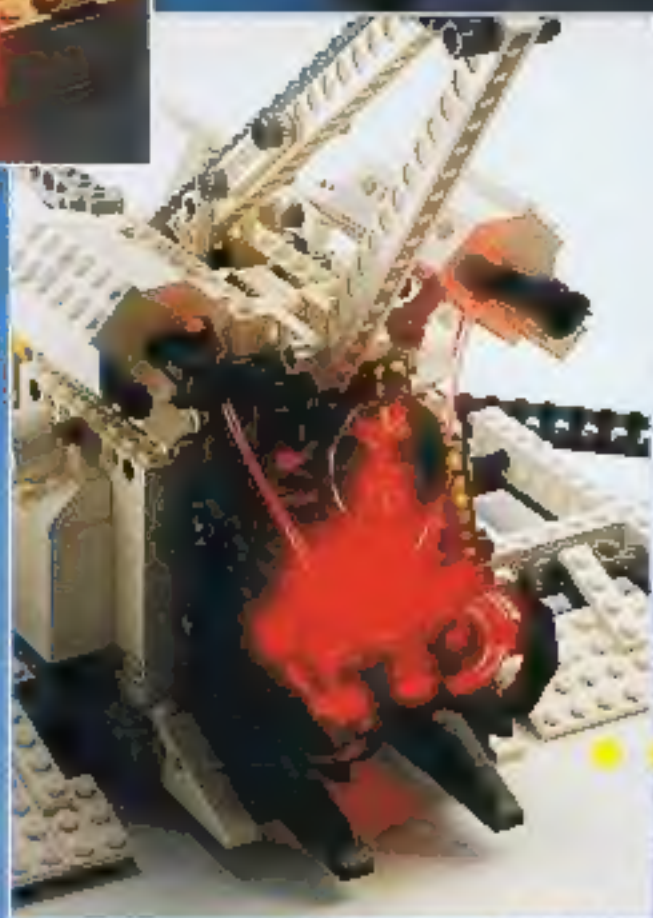
technical functions, communication or product design.

Q What have you designed lately?

A I work as a Product Line designer and I specialise in developing LEGO TECHNIC Starter and Advanced sets for 7 to 16 year-olds.

I was involved in building the LEGO TECHNIC Control Centre, and now worked on a five-gear gearbox.

More recently, I helped to develop the LEGO TECHNIC Space Shuttle Columbia (1998).



...IN PRODUCT DEVELOPMENT

Q Do you have a favourite model and why?

A That's hard - but I'd have to say the Space Shuttle because it's got some great features, including the new LEGO TECHNIC Fibre Optic System (FOS).

There are eight fibre optic strands which light up when you attach them to a battery unit. Just turn the cross axle in the middle - either clockwise or anti clockwise - and hey presto! The strands glow in the dark!

Q How many prototype models of the Space Shuttle did you build?

A After a year in research, the Space Shuttle took three designers a whole year to finish. They did nothing else, which shows how much detail goes into a LEGO TECHNIC model. Around 30 Working versions were built before the final one.

Q That seems a lot!

A Not really - for every ten models in the LEGO TECHNIC range, about 800 prototypes have been built in Product Development.

Q What can you tell us about the 1997 LEGO TECHNIC range?

A Absolutely nothing you'll have to wait and see!



The LEGO TECHNIC Space Shuttle Columbia uses a special function called the Fibre Optic System (FOS). But what are Fibre Optics and how are they used today?

Fibre Optics is the name of a process in which a beam of light is passed through clear glass strands called optical fibres.

Each optical fibre is approximately the size of a single human hair. Light moves along the fibre by bouncing off the sides of the strand.

The two main uses of fibre optics today are in telecommunications and medicine.

Within telecommunications, sound and images are transformed into light pulses and these are transmitted along the fibre optic. At the receiving end, the light is converted back into sound and images. This is an example of how cable television works.

Fibre optics are used in the medical industry in key-hole surgery. Surgeons can view parts of the body that they usually can not get to with the aid of a tiny camera attached to the end of the optical fibre.

Images are transformed into a light beam and transmitted along the fibre. The beam is converted back into images which the surgeon can look at on screen and make a diagnosis.



● EACH FIBRE OPTIC STRAND LIGHTS UP INDIVIDUALLY. HERE WE'VE USED SPECIAL EFFECTS TO SHOW WHICH PARTS ILLUMINATE.



TRING'S BEEN BUZZIN DOWN HIS LINE AGAIN.

He's been busy doin' his 'bizness' - and seeking out LEGO TECHNIC builders and sizing them up for TECH Talk.

Tring's identity is hidden from us. All we know is that he's a

LEGO TECHNIC fanatic hungry for any gen he can get on other LEGO TECHNIC builders. His phone calls could strike any one of you reading now!

So if you want him to pick you out, send in photos of your favourite LEGO TECHNIC models for Tring's attention - we'll *make*

This month Tring's shout goes out to LEGO TECHNIC fanatics John Ozyerkey, and his children, from Sheffield.

John, tell me about yourselves?

I'm the dad and I'm 28 years old and I'm from Loughton, near Sheffield.

Helicopter with motorised propellers

I've been building LEGO TECHNIC models since I was 13 years old and my hobby has just grown since then.

My two eldest children, John aged 10 and Lisa aged 8, have been bitten by the LEGO TECHNIC bug and my youngest, Catherine aged 7 is into LEGO SYSTEM FreeStyle - perhaps she will grow into LEGO TECHNIC - we'll have to see!

They do have other toys, but they always get bored with them and go back to LEGO TECHNIC once the novelty has worn off.

So, why do you like LEGO TECHNIC?

I've always liked building models - and so have the children. LEGO TECHNIC gives you the freedom to make up your own designs and build whatever you want. Its unique design means easy and quick assembly of models and you can bring them to life by making them motorised.

I've built so many models, we've just had an extension built onto the house to create a LEGO TECHNIC workshop.

What's your next project?

At the moment I'm working on a JCB which is to be manoeuvred on a low loader trailer.

What are your children's favourite models?

John and Lisa build anything from cars and motorbikes to boats. Like mine, they are all their own designs and the children really like their imaginations go - it's amazing what they can come up with.

If they do need help - they'll come to me and I'll help them out.

Where do you take your designs from?

All my models are my own designs - I usually take them straight from pictures in magazines and then design the model as I go along.

What do you like best about LEGO TECHNIC magazine?

It shows you the models other people are building - it's good to know I'm not the only LEGO TECHNIC fanatic around.

The children love it especially the latest news on what LEGO TECHNIC ranges are coming out.

That's all for now - but look out for the next issue when it could be you! Watch this space!

Signed Tring.



The Ozyerkey family



Ford Maverick - motorised with 4 wheel drive

Fully motorised 6 axle crane with 6 wheel drive, 4 speed gearbox, lights and telescopic arm



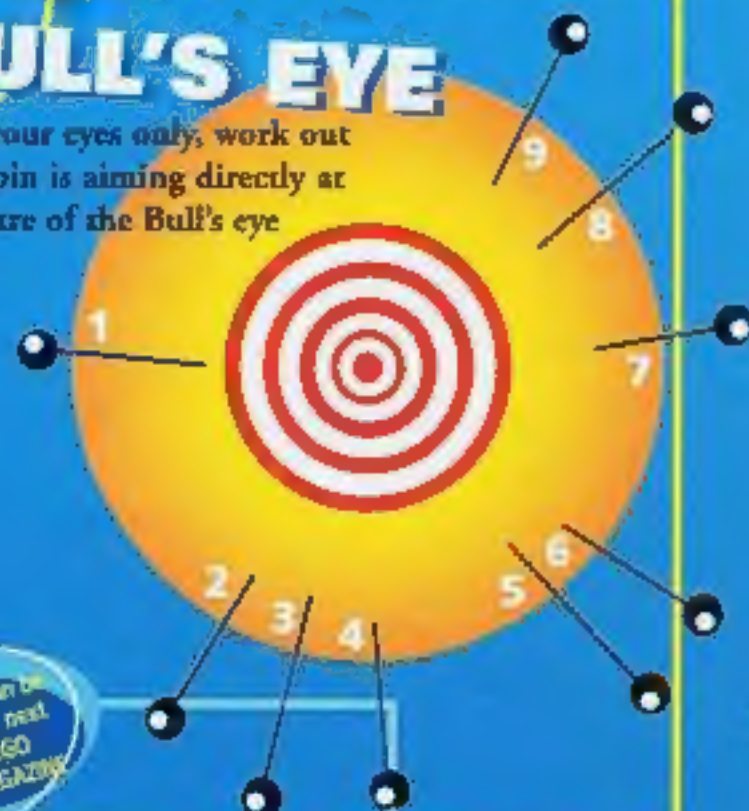


MIND BOGGGLERS PUZZLES AND TEASERS

Just for FUN!

BULL'S EYE

Using your eyes only, work out which pin is aiming directly at the centre of the Bull's eye



The answers can be found in your next issue of LEGO TECHNIC MAGAZINE

NO HIDING PLACE

B	T	F	Q	L	G	V	D
W	G	X	S	J	P	A	F
P	O	U	A	H	N	X	M
M	R	B	K	Z	I	W	S
E	T	V	F	Q	U	C	J
I	C	L	H	R	M	Y	Z

If you cross out all the letters which appear more than once the remaining letters will describe a type of animal

AROUND EUROPE



If you place a letter in the white inner circle, you can mix it with the letters in each segment to find six European countries. Can you work out what letter goes in the centre and name the six countries?



Selection from John's photograph album



THE GREAT LEGO® TECHNIC BUILDING

DARE YOU TAKE ON THE LEGO TECHNIC CHALLENGE?

IT'S SIMPLY RIGHT OUT

THIS
IS WHAT YOU
HAVE TO DO!

BUILD A MODEL FOLLOWING THE
INSTRUCTIONS BELOW AND THEN SEND
US A PHOTO OF IT

- PLEASE DON'T TAKE YOUR MODEL APART AS WE WILL
NEED IT IF YOU ARE A WINNER!

WAIT FOR IT!.....

OK! NOW HERE'S THE CHALLENGE

1 USE AS MANY OF THE ITEMS
(ILLUSTRATED RIGHT) AS YOU
CAN. We understand that you
won't have everything but try
your best!

*Please note that you can use a maximum
of two of any of the beams or plates
illustrated only!*

2 Your model MUST also include
2 GEAR WHEELS of any size
or type.

3 As an EXTRA OPTION you can
use 4 WHEELS, HUBS AND
TYRES - these can be of any
size or type.

4 Along the way you can use as
many cross axles, connector

pegs, half shafts, bushes,
joggle joints etc as you like.

5 You are then allowed to add up
to 6 ADDITIONAL ITEMS of your
choice to the model. For example
you may want to add extra
gear wheels, a motor, pneumatics
- whatever you like!

REMEMBER - IT DOESN'T MATTER WHAT COLOUR THE ELEMENTS ARE, IT IS THE DESIGN WE ARE LOOKING FOR!

And the Prizes? THEY'RE 1st Prize KNOCKOUT!!

AS 1ST PRIZE WINNER SEE YOUR
LEGO TECHNIC MODEL FEATURED IN A
FUTURE ISSUE - AS A BUILDING PLAN
FOR OTHER CLUB MEMBERS TO BUILD.

YOU'LL ALSO WIN A GREAT PRIZE FROM
THE 1997 LEGO TECHNIC RANGE!

2ND PRIZES

TEN RUNNERS-UP WILL EACH GET A

SPECIAL

LEGO TECHNIC BUILDING
CHALLENGE CERTIFICATE

G CHALLENGE

E2 WORLD OF THIS



member, you must include 2 GEAR WHEELS, any size or type. as an EXTRA OPTION you can use 4 WHEELS, HUBS AND TYRES - these can also be of any size or type.



IN THE NEXT ISSUE...

News on the new 1997 range! Watch this space and be the first with the info that counts!

HOT HAPPENINGS AT

LEGOLAND WINDSOR

The LEGO TECHNIC Club and LEGOLAND Windsor are putting on some cool activities for members visiting the Park on three days in October, get these dates in your diary **NOW**

SATURDAY, 18TH OCTOBER, SUNDAY, 20TH OCTOBER AND MONDAY, 21ST OCTOBER

On these dates you will be able to take part in competitions with **GREAT PRIZES** - Meet the Club team, Have a go at the MINILAND TREASURE TRAIL, take part in the LEGO BUILDING BONANZA and meet LEGO MODEL DESIGNERS. Wear your T-shirt or bring along your membership card - to let us know that YOU are there!

AND REMEMBER, as a LEGO TECHNIC Club member you can enter the Park for just £10.00 when you pre-book.

LEGOLAND Windsor Booking Line: 0990 62 63 64

LEGOLAND Windsor Info Line: 0990 62 63 75
(Normal LEGOLAND Windsor rates apply)

BE THERE!

COMPETITION WINNERS

LEGO TECHNIC FLAG COMPETITION

3 Winners receive a £225 LEGO TECHNIC Super Kart

Hugh Ibbotson of Worcester
Thaddeus Cooper of Thame
Zachary Green of Ottery St Mary

LEGO TECHNIC FORMULA 1 COMPETITION

1st Prize - LEGO TECHNIC Octan Indy Racer (8440)

Paul Redmore of Torquay

5 runners-up will receive membership to the Damon Hill Supporters Club

John Molla of Croydon
Hazel Pennock of Harrow
Mike Langford of Dorset
Gregory Keeley of Welwyn Garden City
Richard Coyne of Rossendale

10 x 3rd Prizes of LEGO TECHNIC Formula 1 Racers (8808)

Chris Patrick of Torporley
Peter Millard of Gresham
Claire Radmore of Torquay
Jonathan Rous of Chertsey
Timothy Seed of Southport
Aaron Powell of Wrexham
Alex Findley of Telford
Matthew Lichins of Oxford
Stephen Gill of Bingley
Phillip White of Cheddar

LEGO TECHNIC

CLUB SHOP

TECHNO FAN

2035

2015

2022

SPECIAL OFFER

2036

2039

2028

2027

2038

2037

ORDER FORM

ITEM NUMBER	QUANTITY	PRICE PER ITEM	TOTAL PRICE
POSTAGE & PACKING			60p
TOTAL			

MEMBERSHIP NUMBER

NAME

ADDRESS

POSTCODE

Cheque/Postal Order should be made payable to: LEGO U.K. LIMITED or please charge my Access/Visa

Card no: _____ Expiry date: _____

Cardholders signature: _____

Send to The LEGO TECHNIC Club Shop, Wrexham, LL13 7TQ

CLUB SHOP items

ITEM DESCRIPTION	PRICE
2027 Totally TECHNIC Pen (2 FREE Stick Pens with each pen purchase)	£3.95
"Dare You Enter..." T-SHIRT	
2028 Youth size (34")	£5.75
2029 Small Adult (36")	£8.75
2030 Medium Adult (38")	£6.75
2031 Large Adult (40")	£6.75
2015 LEGO TECHNIC Cap	£1.95
2035 TECHNO Fan Badge	95p
LEGO TECHNIC T-SHIRT	
2022 Youth Size (34")	£5.95
2029 Small Adult (36")	£5.95
2030 Medium Adult (38")	£5.95
2031 Large Adult (40")	£5.95
NEW LEGO TECHNIC Football	
2036	£9.99
NEW LEGO TECHNIC Club Wallet	
2037	£1.99
NEW LEGO TECHNIC Bicycle Bag	
2038	£5.99
NEW LEGO TECHNIC Club Keyring	
2039	99p

SPECIAL OFFER